IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application No.	:	10/566,433	Confirmation No. 5657
Appellants	:	Daisuke MUKAI et al.	
Filed	:	8/6/2004	
Title	:	LOW CO HYDROGEN STORAGE ALLOY	
Group Art Unit	:	1793	
Examiner	:	Jessee Randall Roe	
Customer No.	:	28289	

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Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Appellants appeal the rejections as set forth in the final Office Action mailed on February 16, 2010. This Appeal Brief is submitted in furtherance to the Notice of Appeal electronically filed on July 15, 2010. The Notice of Appeal appeals the final rejection of claims 11, 15, and 17-25. The headings used hereinafter and the subject matter set forth under each heading are in accordance with 37 C.F.R. §41.37.

I hereby certify that this correspondence is being electronically submitted to the United States Patent and Trademark Office on the date below.

November 2, 2010 — Judy Eberle
Date — Signature

Judy Eberle
Typed Name of Person Signing Certificate

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I

REAL PARTY IN INTEREST

Mitsui Mining and Smelting Co., Ltd., having its principal place of business at 11-1, Osaki 1-Chome, Shinagawa-Ku, Tokyo, Japan, is the Assignee of the entire right, title, and interest to the above-identified application and, as such, is the real party in interest in this Appeal.

II

RELATED APPEALS AND INTERFERENCES

There are no appeals or interferences known to the Appellants, the Appellants' legal representative, or the Assignee of the above-identified application which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending Appeal.

III

STATUS OF CLAIMS

Claims 11, 15, and 17-23 are pending in this application and are the subject of this Appeal. Claims 1-5 and 13 have been cancelled, and claim 6-10, 12, 14, and 16 were withdrawn from further consideration in view of an earlier restriction requirement. Accordingly, claims 1-10, 12-14, and 16 are not at issue in this Appeal. Claims 11, 15, and 17-23 stand finally rejected under 35 U.S.C. §103(a) for obviousness based upon United States Patent No. 6,261,517 to Kaneko et al. (hereinafter "the Kaneko patent") alone, or alternatively in view of the article entitled "Improvement of Characteristics of Hydrogen Storage of Mischmetal-Nickel-Manganese Alloy" to Suzuki et al. (hereinafter "the Suzuki article"). Claims 11, 15, 17, and 19 stand finally rejected under 35 U.S.C. §103(a) for obviousness based upon United States Patent No. 6,372,059 to Yasuda et al. (hereinafter "the Yasuda patent") alone, or alternatively in view of the Suzuki article. Claims 11, 15, 17, 19, and 21-23 stand finally rejected under 35 U.S.C. §103(a) for obviousness based upon United States Patent No. 5,910,379 to Kasashima et al. (hereinafter "the Kasashima patent") with evidence from the article entitled "Low-Temperature Heat-Capacity Study of Haucke Compounds CaNi5, YNi5, LaNi5, and ThNi5" to Takeshita et al. (hereinafter "the Takeshita article") alone, or alternatively, in view of the Suzuki article.

IV

STATUS OF AMENDMENTS

All amendments previously made to the claims have been entered. The claims have not been amended after being finally rejected. A copy of the claims, as presently pending, is provided in the Claims Appendix attached hereto.

V

SUMMARY OF CLAIMED SUBJECT MATTER

One representative embodiment of Appellants' invention is set forth in independent claim 11. Independent claim 11 is directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$ (see paragraph [0053] of the specification). Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0 < d \leq 0.35$ (see paragraph [0053] of the specification and table 1 provided on pages 16 and 17 of the specification). In a composition of $5.25 \leq a + b + c + d < 5.30$, the a-axis length of the crystal lattice is not less than 500.5 pm and not more than 502.7 pm, and the c-axis length is not less than 405.6 pm and not more than 406.9 pm (see paragraph [0058] of the specification). The pulverization residual rate obtained by the following equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100 (see paragraph [0059] of the specification). When a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device (see paragraph [0059] of the specification).

Another representative embodiment of Appellants' invention is set forth in independent claim 21. Independent claim 21 is directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$ (see paragraph [0053] of the specification). Mm is a Misch metal, $4.31 \leq$

$a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0 < d \leq 0.35$ (see paragraph [0053] of the specification and table 1 provided on pages 16 and 17 of the specification). In a composition of $5.30 \leq a + b + c + d < 5.35$, the a-axis length of the crystal lattice is not less than 500.0 pm and not more than 502.4 pm, and the c-axis length is not less than 405.9 pm and not more than 407.2 pm (see paragraph [0058] of the specification). The pulverization residual rate obtained by the following equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100 (see paragraph [0059] of the specification). When a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device, the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}), is measured with a particle size distribution measuring device (see paragraph [0059] of the specification).

Another representative embodiment of Appellants' invention is set forth in independent claim 22. Independent claim 22 is directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$ (see paragraph [0053] of the specification). Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0 < d \leq 0.35$ (see paragraph [0053] of the specification and table 1 provided on pages 16 and 17 of the specification). In a composition of $5.35 \leq a + b + c + d < 5.40$, the a-axis length of the crystal lattice is not less than 499.8 pm and not more than 502.3 pm, and the c-axis length is not less than 406.0 pm and not more than 407.3 pm (see paragraph [0058] of the specification). The pulverization residual rate obtained by the following equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100 (see paragraph [0059] of the specification). When a

hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device (see paragraph [0059] of the specification).

Yet another representative embodiment of Appellants' invention is set forth in independent claim 23. Independent claim 23 is directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$ (see paragraph [0053] of the specification). Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0< d \leq 0.35$ (see paragraph [0053] of the specification and table 1 provided on pages 16 and 17 of the specification). In a composition of $5.40 \leq a + b + c + d < 5.45$, the a-axis length of the crystal lattice is not less than 499.7 pm and not more than 502.3 pm, and the c-axis length is not less than 406.1 pm and not more than 407.4 pm (see paragraph [0058] of the specification). The pulverization residual rate obtained by the following equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100 (see paragraph [0059] of the specification). When a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen

gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device (see paragraph [0059] of the specification).

All of the independent claims that are involved in this Appeal are summarized above. Each of these independent claims is argued separately in this Appeal. There are no other independent claims involved in this Appeal.

VI

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Based upon the rejections presented in the final Office Action dated February 16, 2010, Appellants present the grounds of rejection to be reviewed on Appeal:

I. Whether claims 11, 15, and 17-23 were properly rejected under 35 U.S.C. §103(a) for obviousness based upon the Kaneko patent alone, or alternatively in view of the Suzuki article;

II. Whether claims 11, 15, 17, and 19 were properly rejected under 35 U.S.C. §103(a) for obviousness based upon the Yasuda patent alone, or alternatively in view of the Suzuki article; and

III. Whether claims 11, 15, 17, 19, and 21-23 were properly rejected under 35 U.S.C. §103(a) for obviousness based upon the Kasashima patent with evidence from the Takeshita article alone, or alternatively, in view of the Suzuki article.

VII

ARGUMENT

All of the presently pending claims were improperly rejected in the final Office Action. In general, the final Office Action fails to demonstrate that the Kaneko patent and the Kasashima patent, whether considered individually or in combination with the Suzuki article, teach or suggest that the low Co hydrogen storage alloy requires, in a composition of $5.25 \leq a + b + c + d < 5.30$, that the a-axis length of the crystal lattice is not less than 500.5 pm and not more than 502.7 pm, and the c-axis length is not less than 405.6 pm and not more than 406.9 pm as required by independent claim 11; in a composition of $5.30 \leq a + b + c + d < 5.35$, that the a-axis length of the crystal lattice is not less than 500.0 pm and not more than 502.4 pm, and the c-axis length is not less than 405.9 pm and not more than 407.2 pm as required by independent claim 21; in a composition of $5.35 \leq a + b + c + d < 5.40$, that the a-axis length of the crystal lattice is not less than 499.8 pm and not more than 502.3 pm, and the c-axis length is not less than 406.0 pm and not more than 407.3 pm as required by independent claim 22; or, in a composition of $5.40 \leq a + b + c + d < 5.45$, that the a-axis length of the crystal lattice is not less than 499.7 pm and not more than 502.3 pm, and the c-axis length is not less than 406.1 pm and not more than 407.4 pm as required by independent claim 23. In addition, the Kaneko patent, whether considered individually or in combination with the Suzuki article, fails to teach or suggest a low Co hydrogen storage alloy, represented by the general formula $MmNi_aMn_bAl_cCo_d$, having Al in the following range: $0.2 \leq c < 0.37$ as required by the independent claims. Finally, the Yasuada patent, whether considered alone or in combination with the Suzuki article, fails to teach or suggest the claimed low Co hydrogen storage alloy, represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein $4.31 \leq a \leq 4.7$.

For at least these reasons, which are discussed in greater detail hereinafter, Appellants respectfully request that the Board overturn the rejections of the Examiner, and remand this matter to the Examiner with instructions to issue an appropriate Notice of Allowability.

I. Claims 11, 15, and 17-23 are not rendered obvious by the Kaneko patent alone, or alternatively in view of the Suzuki article

Claims 11, 15, and 17-23 stand finally rejected under 35 U.S.C. §103(a) for obviousness based upon the Kaneko patent alone, or alternatively in view of the Suzuki article. In view of the following remarks, the Appellants respectfully request reversal of this rejection.

As defined by independent claim 11, the present invention is directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$. Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0< d \leq 0.35$. In a composition of $5.25 \leq a + b + c + d < 5.30$, the a-axis length of the crystal lattice is not less than 500.5 pm and not more than 502.7 pm, and the c-axis length is not less than 405.6 pm and not more than 406.9 pm. The pulverization residual rate obtained by the following equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100. When a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device, the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

As defined by independent claim 21, the present invention is directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$. Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0< d \leq 0.35$. In a composition of $5.30 \leq a + b + c + d < 5.35$, the a-axis length of the crystal lattice is not less than 500.0 pm and not more than 502.4 pm, and the c-axis length

is not less than 405.9 pm and not more than 407.2 pm. The pulverization residual rate obtained by the following equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100. When a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

As defined by independent claim 22, the present invention is directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$. Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0< d \leq 0.35$. In a composition of $5.35 \leq a + b + c + d < 5.40$, the a-axis length of the crystal lattice is not less than 499.8 pm and not more than 502.3 pm, and the c-axis length is not less than 406.0 pm and not more than 407.3 pm. The pulverization residual rate obtained by the following equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100. When a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the

hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

As defined by independent claim 23, the present invention is directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$. Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0< d \leq 0.35$. In a composition of $5.40 \leq a + b + c + d < 5.45$, the a-axis length of the crystal lattice is not less than 499.7 pm and not more than 502.3 pm, and the c-axis length is not less than 406.1 pm and not more than 407.4 pm. The pulverization residual rate obtained by the following equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100. When a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

The Kaneko patent is directed to a rare earth metal-nickel hydrogen storage alloy of a composition represented by the formula: $RNi_aMn_bCo_cAl_dX_e$, where R stands for one or more rare earth elements including Sc and Y, not less than 95 atom % of which is one or more elements selected from the group consisting of La, Ce, Pr, and Nd; X stands for one or more elements selected from the group consisting of Fe, Cu, Zn, V, and Nb; a, b, c, d, and e satisfy the relations of $3.9 \leq a < 6.0$, $0.45 \leq b < 1.5$, $0.01 \leq c < 0.3$, $0.4 \leq d < 1$, $0 \leq e \leq 0.2$, and $5.2 \leq a+b+c+d+e \leq 7.5$, the alloy having a matrix of $CaCu_5$ structure, and a Mn-rich secondary phase of 0.3 to 5 μm is finely dispersed in the matrix at surface ratio of 0.3 to 7%.

Independent claims 1 and 21-23 each require the claimed low Co hydrogen storage alloy, represented by the general formula $MmNi_aMn_bAl_cCo_d$, to have Al in the following range: $0.2 \leq c < 0.37$. The Kaneko patent does not teach or suggest such a feature. Instead, in the Kaneko patent, the range for Al is $0.4 \leq d \leq 1$ (*see* the Abstract of the Kaneko patent). Accordingly, the Kaneko patent does not teach or suggest a range of Al as required by the claimed invention. The Suzuki article is directed to Mischmetal-Nickel-Manganese hydrogen storage alloy, and is provided by the Examiner as allegedly disclosing that the axis length varies depending on heat treatment conditions. The Suzuki article does not cure the deficiencies of the Kaneko patent.

In addition, the range of Al of the amended independent claims would not be obvious in view of the Kaneko patent, whether considered alone or in combination with the Suzuki article. A prior art reference must be considered <u>for all of its teachings</u>, including a disclosure that diverges and teaches away from the invention at hand as well as disclosures that point toward and teach the invention when interpreting the patentability of a claim. A *prima facie* case of obviousness cannot exist where a reference teaches away from the claimed invention. The Kaneko patent clearly teaches away from Appellants' claimed range of Al of $0.2 \leq c < 0.37$ by stating that "Al is in the range of $0.4 \leq d \leq 1$, preferably $0.5 \leq d \leq 0.7$. If 'd' is less than 0.4, <u>the hydrogen equilibrium pressure of the alloy increases, and the corrosion resistance of the alloy decreases</u>" (Emphasis added).

Accordingly, the Kaneko patent, whether considered alone or in combination with the Suzuki article, teaches away from the claimed invention and the advantages and properties of the hydrogen storage alloy of the present invention cannot be expected from the hydrogen storage alloy of the Kaneko patent.

Furthermore, the Kaneko patent, whether considered alone or in combination with the Suzuki article, does not teach or suggest, and in fact, does not even mention that the low Co hydrogen storage alloy requires, in a composition of $5.25 \leq a + b + c + d < 5.30$, that the a-axis length of the crystal lattice is not less than 500.5 pm and not more than 502.7 pm, and the c-axis length is not less than 405.6 pm and not more than 406.9 pm as required by independent claim 11; in a composition of $5.30 \leq a + b + c + d < 5.35$, that the a-axis length of the crystal lattice is not less than 500.0 pm and not more than 502.4 pm, and the c-axis

length is not less than 405.9 pm and not more than 407.2 pm as required by independent claim 21; in a composition of $5.35 \leq a + b + c + d < 5.40$, that the a-axis length of the crystal lattice is not less than 499.8 pm and not more than 502.3 pm, and the c-axis length is not less than 406.0 pm and not more than 407.3 pm as required by independent claim 22; or, in a composition of $5.40 \leq a + b + c + d < 5.45$, that the a-axis length of the crystal lattice is not less than 499.7 pm and not more than 502.3 pm, and the c-axis length is not less than 406.1 pm and not more than 407.4 pm as required by independent claim 23.

As stated in paragraphs [0070] and [0071] of the specification of the above-referenced application, the a-axis length and c-axis length of the crystal lattice are greatly influenced by casting conditions and heat-treatment conditions. Although a component composition of the alloy of the Kaneko patent and the alloy of the claimed invention overlap, the a-axis length and the c-axis length are not the same. This is evident from the findings set forth in the Declaration under 37 C.F.R. §1.132 of Shinya Kagei submitted with the Amendment of July 7, 2009 and labeled Declaration 1 (hereinafter "Declaration 1"). Declaration 1 sets forth experimental data that confirms that the a-axis length and the pulverization residual rate of the storage alloy disclosed in the Kaneko patent do not fall within the range specified in independent claims 11 and 21-23 by reproducing Example I of the Kaneko patent. This experimental data clearly shows the hydrogen storage alloy of the Kaneko patent does not have an a-axis length that falls within the claimed range (*see* paragraph 6 of Declaration 1) and the pulverization residual rate of the hydrogen storage alloy does not fall within the claimed range (*see* paragraph 6 of Declaration 1).

In addition, and as mentioned hereinabove, independent claim 11 requires that the c-axis length is not less than 405.6 pm (4.056 Å) and not more than 406.9 pm (4.069 Å); independent claim 21 requires that the c-axis length is not less than 405.9 pm (4.059 Å) and not more than 407.2 pm (4.072 Å); independent claim 22 requires that the c-axis length is not less than 406.0 pm (4.060 Å) and not more than 407.3 pm (4.073 Å); and independent claim 23 requires that the c-axis length is not less than 406.1 pm (4.061 Å) and not more than 407.4 pm (4.074 Å) as required by independent claim 23. The Examiner relies on the Suzuki article as disclosing that c-axis length varies and therefore can be modified depending on the heat treatment conditions. FIG. 6(B) of the Suzuki article illustrates this relationship between heat

treatment temperature and c-axis length. FIG. 6(B) of the Suzuki article is reproduced hereinafter.

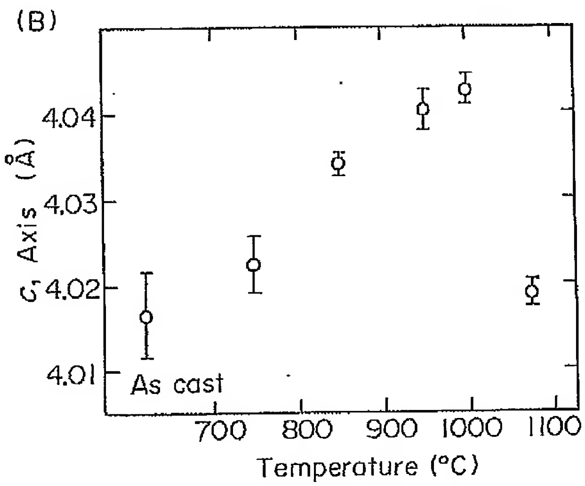

Fig. 6 Lattice parameters, a (A) and c (B), of $MmNi_{4.5}Mn_{0.5}$ as a function of temperature of annealing for 2 hrs.

This graph illustrates that as temperature increases, the c-axis length becomes longer and reaches about 4.04Å at a maximum in a heat treatment temperature range of 700° to 1000° C. However, as clearly seen in the graph of FIG. 6(B), the c-axis length becomes dramatically smaller when the heat treatment temperature is above 1000° C. Accordingly, the Suzuki article discloses c-axis lengths that are below the claimed ranges of claims 11 and 21-23. In addition, FIG. 6(B) of the Suzuki article clearly discloses that the claimed c-axis lengths of claims 11 and 21-23 cannot be achieved by merely increasing the heat treatment temperature as the Examiner contends.

Finally, the pulveration rate is kept higher than 50% in claims 11 and 21-23 by prescribing appropriate a-axis length and c-axis length at each range of ABx. Such a relationship is not taught or suggested by the Kaneko patent or any of the other references cited in the final Office Action.

Appellants respectfully submit that independent claims 11 and 21-23 are allowable over the Kaneko patent alone, or alternatively in view of the Suzuki article for at least the foregoing reasons. Appellants respectfully request that the rejection of claims 11 and

21-23 as obvious in view of the Kaneko patent alone, or alternatively in view of the Suzuki article under 35 U.S.C. §103, be reversed.

Claims 15 and 17-20 are dependent, either directly or indirectly, upon independent claim 11 and are allowable over the Kaneko patent alone or in combination with the Suzuki article for at least the same reasons as independent claim 11. Appellants respectfully request that the rejection of claims 15 and 17-20 as obvious in view of the Kaneko patent alone, or alternatively in view of the Suzuki article under 35 U.S.C. §103, be reversed.

II. Claims 11, 15, 17, and 19 are not rendered obvious by the Yasuda patent alone, or alternatively in view of the Suzuki article

Claims 11, 15, 17, and 19 stand finally rejected under 35 U.S.C. §103(a) for obviousness based upon the Yasuda patent alone, or alternatively in view of the Suzuki article. In view of the following remarks, the Appellants respectfully request reversal of this rejection.

As discussed in greater detail hereinabove, the present invention, as defined by independent claim 11, is generally directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$.

The Yasuda patent discloses a hydrogen storage material which is an AB_5 type hydrogen storage alloy having a $CaCu_5$ type crystal structure represented by general formula: $MmNi_aMn_bAl_cCo_dX_e$, where Mm denotes a Misch metal, $4.0 < a \leq 4.3$, $0.25 \leq b \leq 0.4$, $0.25 \leq c \leq 0.4$, $0.3 \leq d \leq 0.5$, and $5.05 \leq a + b + c + d \leq 5.25$ and X is Cu and/or Fe.

The Yasuda patent, whether considered alone or in combination with the Suzuki article, does not teach or suggest a low Co hydrogen storage alloy, represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein $4.31 \leq a \leq 4.7$ as required by independent claim 11. In the Yasuda patent, the range of *a* is $4.0 < a \leq 4.3$ (*see* the Abstract of the Yasuda patent). The Examiner contends that although the Yasuda patent does not disclose a range of a that is within the claimed range of a or overlaps the claimed range of a, a *prima facie* case of obviousness exists because the claimed ranges and prior art ranges do not overlap, but are close enough that one skilled in the art would have expected them to have the same

properties. While this statement by the Examiner is true, the law requires that a reference be considered for all of its teachings, including a disclosure that diverges and teaches away from the invention at hand, as well as disclosures that point toward and teach the invention when interpreting the patentability of a claim. A *prima facie* case of obviousness cannot exist where a reference teaches away from the claimed invention. The Yasuda patent, clearly teaches away from Appellants' claimed invention by stating that "the ratio of Ni, a, is from 4.0 to 4.3, desirably from 4.1 to 4.2. If a is less than 4.0, the discharge characteristics are not satisfactory. If it exceeds 4.3, deterioration in insusceptibility to grain size reduction or life characteristics is observed" (Emphasis added).

Accordingly, the Yasuda patent teaches away from the claimed invention and the advantages and properties of the hydrogen storage alloy of the present invention cannot be expected from the hydrogen storage alloy of the Yasuda patent. The Suzuki article does not cure this deficiency.

Furthermore, the Examiner has mischaracterized independent claim 11 as a product-by-process claim and contends that claim 11 is unpatentable in view of the Yasuda patent even though the hydrogen storage alloy of the Yasuda patent is made from a different process (see page 8 of the final Office Action). However, the pulverization residual rate of the low Co hydrogen storage alloy of independent claim 11 is a property of the low Co hydrogen storage alloy and not a method of manufacturing a low Co hydrogen storage alloy. Accordingly, the pulverization residual rate of the low Co hydrogen storage alloy, along with the steps for determining this rate, of independent claim 11 must be considered by the Examiner because "[t]he structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art" (*see* Manual of Patent Examining Procedure (MPEP) §2113).

To establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. Where claimed limitations are simply not present in the prior art, a *prima facie* obviousness rejection is not supported. Accordingly, since the Yasuda patent fails to teach or suggest a low Co hydrogen storage alloy, represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein $4.31 \leq a \leq 4.7$ and a low Co hydrogen storage alloy having a pulverization residual rate obtained by the following

equation is 50% or more: Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100 as required by independent claim 11 as discussed above, a *prima facie* case of obviousness has not been established.

Appellants respectfully submit that independent claim 11 is allowable over the Yasuda patent alone, or alternatively in view of the Suzuki article for at least the foregoing reasons. Appellants respectfully request that the rejection of claim 11 as obvious in view of the Yasuda patent alone, or alternatively in view of the Suzuki article under 35 U.S.C. §103, be reversed.

Claims 15, 17, and 19 are dependent, either directly or indirectly, upon independent claim 11 and are allowable over the Kaneko patent alone or in combination with the Suzuki article for at least the same reasons as independent claim 11. Appellants respectfully request that the rejection of claims 15, 17, and 19 as obvious in view of the Kaneko patent alone, or alternatively in view of the Suzuki article under 35 U.S.C. §103, be reversed.

III. Claims 11, 15, 17, 19, and 21-23 are not rendered obvious by the Kasashima patent with evidence from the Takeshita article alone, or alternatively in view of the Suzuki article

Claims 11, 15, 17, 19, and 21-23 stand finally rejected under 35 U.S.C. §103(a) for obviousness based upon the Kasashima patent with evidence from the Takeshita article alone, or alternatively, in view of the Suzuki article. In view of the following remarks, the Appellants respectfully request reversal of this rejection.

As discussed in greater detail hereinabove, the present invention, as defined by independent claims 11 and 21-23, is generally directed to a low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$.

The Kasashima patent is directed to a hydrogen absorbing alloy represented by the general formula $RNi_aCo_bAl_cM_d$, where R is a rare earth metal other than Pr, $3.0 < a \leq 4.5$, $0.3 \leq b \leq 1.0$, $0 \leq c \leq 0.6$, $0 \leq d \leq 0.5$, and $4.55 \leq a + b + c + d \leq 5.5$ and M is one or more metals selected from the group consisting of Fe, Mn, Cr, and Cu. The Takeshita article is

provided as allegedly disclosing that a $LaNi_5$ structure is a type of $CaCu_5$ crystal structure.

The Kasashima patent, whether considered alone or in combination with the Takeshita article and the Suzuki article, does not teach or suggest, and, in fact, does not even mention that the low Co hydrogen storage alloy requires, in a composition of $5.25 \leq a + b + c + d < 5.30$, that the a-axis length, of the crystal lattice is not less than 500.5 pm and not more than 502.7 pm, and the c-axis length is not less than 405.6 pm and not more than 406.9 pm as required by independent claim 11; in a composition of $5.30 \leq a + b + c + d < 5.35$, that the a-axis length of the crystal lattice is not less than 500.0 pm and not more than 502.4 pm, and the c-axis length is not less than 405.9 pm and not more than 407.2 pm as required by independent claim 21; in a composition of $5.35 \leq a + b + c + d < 5.40$, that the a-axis length of the crystal lattice is not less than 499.8 pm and not more than 502.3 pm, and the c-axis length is not less than 406.0 pm and not more than 407.3 pm as required by independent claim 22; or, in a composition of $5.40 \leq a + b + c + d < 5.45$, that the a-axis length of the crystal lattice is not less than 499.7 pm and not more than 502.3 pm, and the c-axis length is not less than 406.1 pm and not more than 407.4 pm as required by independent claim 23.

As stated in paragraphs [0070] and [0071] of the specification of the above-referenced application, the a-axis length and c-axis length of the crystal lattice are greatly influenced by casting conditions and heat-treatment conditions. Although a component composition of the alloy of the Kasashima patent and the alloy of the claimed invention overlap, the a-axis length and the c-axis length are not the same. The Takeshita article and the Suzuki article do not cure this deficiency.

More specifically, the heat treatment temperature disclosed in the Kasashima patent is 800° to 1200° C (see column 8, lines 5-9) and that of the Examples disclosed in the Kasashima patent is 900° C. In the Kasashima patent, however, it is disclosed that Mo is added in order to produce an intermetallic compound together with Co in the hydrogen absorbing alloy. The resulting intermetallic compound exists as a secondary phase, and becomes the starting point of the crack of the hydrogen absorbing alloy caused by expansion and shrinkage when hydrogen is charged and discharged, and improves the initial low temperature property (see column 4, line 1-9).

By most definitions, the secondary phase that includes Mo and Co disappears if it is heat treated at a high temperature such as above 1000° C. Dispersing such a phase is the one purpose for heat treatment. Therefore, heat treatment is done at low temperatures such as 900° C in the Example of the Kasashima patent (see column 6, lines 35-40).

In view of the above, it is unlikely to perform heat treatment above 1000° C in the Kasashima patent since the secondary phase disappears which is the key point of the invention disclosed in the Kasashima patent. The claimed a-axis length and the c-axis length cannot be achieved unless heat treated at above 1000° C. Therefore the present invention is different from the Kasashima patent.

Appellants respectfully submit that independent claims 11 and 21-23 are allowable over the Kasashima patent with evidence from the Takeshita article alone, or alternatively in view of the Suzuki article for at least the foregoing reasons. Appellants respectfully request that the rejection of claims 11 and 21-23, as obvious in view of the Kaneko patent alone, or alternatively in view of the Suzuki article under 35 U.S.C. §103, be reversed.

Claims 15, 17, and 19 are dependent, either directly or indirectly, upon independent claim 11 and are allowable over the Kasashima patent with evidence from the Takeshita article alone or in combination with the Suzuki article for at least the same reasons as independent claim 11. Appellants respectfully request that the rejection of claims 15, 17, and 19, as obvious in view of the Kasashima patent with evidence from the Takeshita article alone, or alternatively in view of the Suzuki article under 35 U.S.C. §103, be reversed.

VIII

CONCLUSION

For the reasons set forth above, Appellants submit that claims 11, 15, and 17-23 are indeed patentable over the cited art and are in condition for allowance. Reversal of all of the Examiner's rejections and allowance of these claims are respectfully requested.

The Commissioner for Patents and Trademarks is hereby authorized to charge the fee of $540.00 by credit card, which information accompanies this Appeal Brief. The Commissioner for Patents and Trademarks is hereby authorized to charge any additional fees which may be required to Deposit Account Number 23-0650. Please refund any overpayments to Deposit Account Number 23-0650.

Respectfully submitted,

THE WEBB LAW FIRM

By Kent E. Baldauf

Kent E. Baldauf
Registration No. 25,826
Attorney for Appellants
436 Seventh Avenue
700 Koppers Building
Pittsburgh, PA 15219
Telephone: (412) 471-8815
Facsimile: (412) 471-4094
E-mail: webblaw@webblaw.com

CLAIMS APPENDIX

1-5. (Cancelled)

6. (Withdrawn) A low Co hydrogen storage alloy having a $CaCu_5$-type crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_dFe_e$, wherein Mm is a Misch metal, $4.0 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c \leq 0.5$, $0 < d \leq 0.35$, $0 < e \leq 0.11$, $5.2 \leq a + b + c + d + e \leq 5.5$, wherein the a-axis length of the crystal lattice of said $CaCu_5$-type crystal structure is 499 pm or more, and the c-axis length is 405 pm or more.

7. (Withdrawn) The low Co hydrogen storage alloy according to claim 6, wherein, in a composition of $5.25 \leq a + b + c + d + e < 5.30$, the a-axis length of the crystal lattice is not less than 500.5 pm and not more than 502.7 pm, and the c-axis length is not less than 406.6 pm and not more than 407.9 pm.

8. (Withdrawn) The low Co hydrogen storage alloy according to claim 6, wherein, in a composition of $5.30 \leq a + b + c + d + e < 5.35$, the a-axis length of the crystal lattice is not less than 500.0 pm and not more than 502.4 pm, and the c-axis length is not less than 406.9 pm and not more than 408.2 pm.

9. (Withdrawn) The low Co hydrogen storage alloy according to claim 6, wherein, in a composition of $5.35 \leq a + b + c + d + e < 5.40$, the a-axis length of the crystal lattice is not less than 499.8 pm and not more than 502.3 pm, and the c-axis length is not less than 407.0 pm to 408.3 pm.

10. (Withdrawn) The low Co hydrogen storage alloy according to claim 6, wherein, in a composition of $5.40 \leq a + b + c + d + e < 5.45$, the a-axis length of the crystal lattice is not less than 499.7 pm and not more than 502.3 pm, and the c-axis length is not less than 407.1 pm and not more than 408.4 pm.

11. (Previously Presented) A low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0< d \leq 0.35$,

wherein, in a composition of $5.25 \leq a + b + c + d < 5.30$, the a-axis length of the crystal lattice is not less than 500.5 pm and not more than 502.7 pm, and the c-axis length is not less than 405.6 pm and not more than 406.9 pm,

wherein the pulverization residual rate obtained by the following equation is 50% or more:

Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100,

when a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

12. (Withdrawn) The low Co hydrogen storage alloy according to claim 6, wherein the pulverization residual rate obtained by the following equation is 50% or more:

Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100,

when a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen

storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

13. (Cancelled)

14. (Withdrawn) A cell having a configuration comprising the low Co hydrogen storage alloy according to claim 6 as a negative-electrode active material.

15. (Previously Presented) A cell having a configuration comprising the low Co hydrogen storage alloy according to claim 11 as a negative-electrode active material.

16. (Withdrawn) A cell having a configuration comprising the low Co hydrogen storage alloy according to claim 12 as a negative-electrode active material.

17. (Previously Presented) A low Co hydrogen storage alloy having a $CaCu_5$ crystal structure according to claim 11, wherein $0.4 < b \leq 0.55$ in the general formula $MmNi_aMn_bAl_cCo_d$.

18. (Previously Presented) A low Co hydrogen storage alloy having a $CaCu_5$ crystal structure according to claim 11, wherein $0 < d \leq 0.2$ in the general formula $MmNi_aMn_bAl_cCo_d$.

19. (Previously Presented) A cell having a configuration comprising a low Co hydrogen storage alloy according to claim 17 as a negative-electrode active material.

20. (Previously Presented) A cell having a configuration comprising a low Co hydrogen storage alloy according to claim 18 as a negative-electrode active material.

21. (Previously Presented) A low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0< d \leq 0.35$,

wherein, in a composition of $5.30 \leq a + b + c + d < 5.35$, the a-axis length of the crystal lattice is not less than 500.0 pm and not more than 502.4 pm, and the c-axis length is not less than 405.9 pm and not more than 407.2 pm,

wherein the pulverization residual rate obtained by the following equation is 50% or more:

Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100,

when a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

22. (Previously Presented) A low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0< d \leq 0.35$,

wherein, in a composition of $5.35 \leq a + b + c + d < 5.40$, the a-axis length of the crystal lattice is not less than 499.8 pm and not more than 502.3 pm, and the c-axis length is not less than 406.0 pm and not more than 407.3 pm,

wherein the pulverization residual rate obtained by the following equation is 50% or more:

Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100,

when a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

23. (Previously Presented) A low Co hydrogen storage alloy having a $CaCu_5$ crystal structure that can be represented by the general formula $MmNi_aMn_bAl_cCo_d$, wherein Mm is a Misch metal, $4.31 \leq a \leq 4.7$, $0.3 \leq b \leq 0.65$, $0.2 \leq c < 0.37$, $0 < d \leq 0.35$,

wherein, in a composition of $5.40 \leq a + b + c + d < 5.45$, the a-axis length of the crystal lattice is not less than 499.7 pm and not more than 502.3 pm, and the c-axis length is not less than 406.1 pm and not more than 407.4 pm,

wherein the pulverization residual rate obtained by the following equation is 50% or more:

Pulverization residual rate (%) = (post-cycling particle size/pre-cycling particle size) x 100,

when a hydrogen storage alloy is ground and screened to select particles with a particle size in the range of 20 μm and 53 μm to provide hydrogen storage alloy powder, and after measuring with a particle size distribution measuring device the average particle size (pre-cycling particle size, D_{50}) of the hydrogen storage alloy powder; 2 g of the hydrogen storage alloy powder is weighed and placed into a PCT holder; the surfaces thereof are cleaned twice under hydrogen pressure of 1.75 MPa; then activation is carried out twice by introducing hydrogen of 3 MPa; next, a cycle test using a PCT device is then repeated 50 times, wherein hydrogen gas of 3 MPa is introduced into 2.0 g of the hydrogen storage alloy powder to absorb hydrogen, and the hydrogen is desorbed at 45°C; and the average particle size of the hydrogen storage alloy powder after the test of the 50 cycles (post-cycling particle size, D_{50}) is measured with a particle size distribution measuring device.

EVIDENCE APPENDIX

1. Declaration under 37 C.F.R. §1.132 by Shinya Kagei, labeled Declaration 1, previously submitted on July 7, 2009.

2. Declaration under 37 C.F.R. §1.132 by Shinya Kagei, labeled Declaration 2, previously submitted on July 7, 2009.

RELATED PROCEEDINGS APPENDIX

None.